ASIA PACIFIC

2020 EPOXY PRODUCT LISTING

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Introduction

Expanding Opportunities for Performance and Differentiation

Epoxy technology is a fundamental building block for innovation across broad and diverse industries around the world such as wind energy, construction and electrical laminates. Olin is leading the way, applying advanced epoxy chemistry to address critical material challenges and helping meet society's every day energy, transportation, electronics, and infrastructure needs.

Olin is a global manufacturer of chemical products, producing chlorine, caustic soda, potassium hydroxide, vinyls, epoxy, chlorinated organics, and bleach. With more than 60 years of Epoxy innovation, we offer advanced epoxy products and solutions based on the industry's leading product and process technology. And, as one of the most vertically integrated epoxy suppliers, we are a highly reliable source of product. Through our experienced professionals and commitment to continuous innovation, uncompromising integrity and exceptional service, we ensure customer success throughout the chlorine value chain and beyond.

This guide presents Olin's comprehensive listing of epoxy products available in the Asia Pacific region.

For assistance in choosing the right product for your formulation, or to investigate emerging innovation, please contact us. Contact information is located on the back of this brochure.

About Olin

INCORPORATED IN
1892

OFFICES AND
MANUFACTURING
FACILITIES IN
NEARLY 20 COUNTRIES
WORLDWIDE

MORE THAN 60 YEARS
OF EPOXY PRODUCTS,
SOLUTIONS, AND
INNOVATION

LISTED ON NYSE
FOR OVER **100 YEARS**

 # 1 GLOBAL SUPPLIER
OF EPOXY MATERIALS

Liquid Epoxy Resins, D.E.R.™ 300s, and D.E.H.™ Hardeners

Bisphenol A Epoxy Resins

Grade	EEW	Viscosity mPa·s @ 25 °C	Description	Application				
				C	PC	CEA	EE	WBC
D.E.R. 331	182-192	11,000-14,000	Industry standard bisphenol A-based liquid epoxy resin. Offers excellent mechanical, thermal, and chemical resistance properties in multiple applications.	√		√		
D.E.R. 383	176-183	9,000-10,500	Lower viscosity bisphenol A epoxy resin allowing the use of fewer diluents or more fillers in the formulation. Offers longer pot life versus the standard resin and slightly improved resistance properties when used in heat curing applications.	√		√	√	√
D.E.R. 330	176-185	7,000-10,000	Lower viscosity bisphenol A epoxy resin allowing the use of fewer diluents or more fillers in the formulation. Offers longer pot life versus the standard resin and slightly improved resistance properties when used in heat curing applications.				√	√
D.E.R. 332	171-175	4,000-6,000	High purity diglycidyl ether of bisphenol A. Its high purity and low oligomer content assure uniform performance, exceptionally low viscosity, and improved elevated temperature properties over standard epoxy resins.	√		√	√	√
D.E.R. 337	230-250	400-800[1]	Intermediate epoxy equivalent weight semi-solid epoxy resin, mainly used in adhesives and protective coatings, or as a modifier for other epoxy resins to improve impact strength, extensibility, and adhesion.	√		√		

[1]Measured in 70 wt% in diethylene glycol monobutyl ether

Bisphenol F Epoxy Resins

Grade	EEW	Viscosity mPa·s @ 25 °C	Description	Application				
				C	PC	CEA	EE	WBC
D.E.R. 354	167-174	3,400-4,200	Standard bisphenol F based epoxy resin of low viscosity, used for solvent-free coatings, concrete reinforcements, adhesives, electrical insulation, and filament winding.	√		√		√

Low Viscosity Epoxy Resin Blends, Modified Epoxy Resins

Grade	EEW	Viscosity mPa·s @ 25 °C	Description	Application				
				C	PC	CEA	EE	WBC
D.E.R. 301	245-265	10,000-14,000	Modified liquid epoxy resin designed for high solid formulation (80 % volume solid above) with similar viscosity, improved flexibility, longer pot life, and anticorrosion performance comparing with D.E.R. 331.	√		√		
D.E.R. 324	195-204	600-800	Offers low viscosity and low surface tension to wet the surface better, giving better adhesion and slightly lower viscosity at any given filler loading. The diluent increases pot life, flexibility (impact resistance) and acid resistance, but limits the solvent resistance. Prone to crystallization.	√		√		
D.E.R. 351	169-181	4,500-6,500	Bisphenol A/F resin with very low tendency to crystallize. Applications include solvent-free coating, tank and pipe linings, concrete reinforcements, and also floorings, adhesives, electrical insulation, and filament winding.	√		√		
D.E.R. 353	190-200	800-1,000	Low viscosity epoxy resin with very low crystallization tendency. Offers low surface tension to wet the surface better, giving better adhesion. The diluent increases pot life, flexibility (impact resistance), and acid resistance.	√		√		

Application Abbreviations

Coatings (C) Powder Coatings (PC) Civil Engineering Adhesives (CEA) Electrical Electronics (EE) Wind Blades Composites (WBC)

Liquid Epoxy Resins, D.E.R.™ 300s, and D.E.H.™ Hardeners

Modified Amine Hardener

Grade	AHEW	Viscosity mPa·s @ 25 °C	Description	Application				
				C	PC	CEA	EE	WBC
D.E.H. 4702	115	370-570	Excellent early water spot resistance combined with high acid and solvent resistance.	√		√		

Low Temperature Cure Hardeners

Grade	AHEW	Viscosity mPa·s @ 25 °C	Description	Application				
				C	PC	CEA	EE	WBC
D.E.H. 613	90	900-1,300	Fast curing Mannich base hardener with no benzyl alcohol. Good chemical resistance and water spot resistance. It can also be used as an accelerator of other amines and polyamines.	√		√		
D.E.H. 615	75	400-500	Low viscosity version of D.E.H. 613 curing agent. Over-coatable after 4 hours (industrial coatings).	√		√		
D.E.H. 622	60	490-690	Modified amine curing agent with extreme high reactivity. Cures down to -5 °C.	√		√		

Novolac Type Epoxy Resins, D.E.N.™ 400s

Novolac Type Epoxy Resins, D.E.N.™ 400s

Grade	EEW on Solid	Viscosity mPa·s @ 25 °C	Viscosity mPa·s @ 51.7 °C	Solid Content %	Description	Application				
						C	PC	CEA	EE	WBC
D.E.N. 431	172-179		1,100-1,700		Approximately 2.8 functional liquid epoxy novolac resin.	√		√	√	√
D.E.N. 438	176-181		31,000-40,000		Industry standard semi-solid type phenol novolac epoxy resin having approximately 3.6 functionality.	√		√	√	√
D.E.N. 438-A85	176-181	500-1,200		84-86	Solution of D.E.N. 438 in acetone.				√	√
D.E.N. 438-EK85	176-181	600-1,600		84-86	Solution of D.E.N. 438 in methyl ethyl ketone.	√			√	√
D.E.N. 438-X80	176-181	1,200-2,000		79-81	Solution of D.E.N. 438 in xylene.	√		√		

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Brominated Epoxy, Halogen Free Resins, D.E.R™ 500s, and PROLOGIC™

Low Brominated Epoxy Resins

Grade	EEW on Solid	Viscosity mPa·s @ 25 °C	Br Content % as Solid	Solid Content %	Description	Application				
						C	PC	CEA	EE	WBC
D.E.R. 530-A80	425-440	1,500-2,500	19.5-20.5	79.5-81.5	Standard brominated epoxy resin in acetone.				√	
D.E.R. 538-A80	465-495	800-1,800	21 min.	79-81	Standard brominated epoxy resin in acetone. Slightly higher bromine content than D.E.R. 530-A80.				√	
D.E.R. 539-A80	430-470	1,000-1,600	19-21	79-81	Standard brominated epoxy resin in acetone having UV blocking properties.				√	
D.E.R. 539-EK80	430-470	1,500-2,000	19-21	79-81	Standard brominated epoxy resin in methyl ethyl ketone having UV blocking properties.				√	

High Brominated Epoxy Resins

Grade	EEW on Solid	Softening Point °C	Br Content % as Solid	Description	Application				
					C	PC	CEA	EE	WBC
D.E.R. 542	305-355	52-62	46-51	Solid epoxy resin of tetrabromo bisphenol A epichlorohydrin type.			√	√	√
D.E.R. 560	440-470	78-85	47-51	Solid epoxy resin of tetrabromo bisphenol A epichlorohydrin type.			√	√	√

Specialty Epoxy Resins – Brominated

Grade	EEW on Solid	Viscosity mPa·s @ 25 °C	Br Content % as Solid	Solid Content %	Description	Application				
						C	PC	CEA	EE	WBC
D.E.R. 592-A80	350-370	1,000-2,400	16.5-18	79-81	Oxazolidone modified brominated epoxy resin in acetone.				√	
D.E.R. 593	350-370	400-1,100	16.5-18	75-77	Oxazolidone modified brominated epoxy resin in acetone and propylene glycol monomethyl ether. Allows quicker cure and higher Tg due to the large amount of catalyst that can be added.				√	
XU-19074.00	315-365	(report)	17-19	74.5-76.5	High Tg oxazolidone modified brominated epoxy resin in acetone.				√	
XQ-82937.00	250-280	200-800	11-12	79-81	Mid Tg oxazolidone modified brominated epoxy resin in acetone.				√	
XZ-92754.00	240-280	1,500-3,500	13.5-14.5	74-76	High Tg high Td brominated epoxy resin for phenolic cure system.				√	

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Brominated Epoxy, Halogen Free Resins, D.E.R™ 500s, and PROLOGIC™

Specialty Epoxy Resins – Non-Brominated

Grade	EEW on Solid	Viscosity mPa·s @ 25 °C	Solid Content %	Description	Application				
					C	PC	CEA	EE	WBC
XZ-97103.00	280-305	500-2,500	74-76	Low molecular weight oxazolidone modified epoxy resin to improve toughness. To be used as an adhesion promoter as well.				√	
XZ-97103.02	280-305	500-2,500	74-76	Low molecular weight oxazolidone modified epoxy resin to improve toughness. To be used as an adhesion promoter as well.				√	
D.E.R. 858	380-420			Mid molecular weight oxazolidone modified solid epoxy resin with softing point of 95-105 °C.				√	
XZ-92566.00	825-1,000	3,000-9,000 cSt	47-52	High molecular weight oxazolidone modified epoxy resin to improve toughness. To be used as a flow control agent as well.				√	
XZ-92748.00	176-181	(report)	84-86	Multi-functional epoxy resin in propyl-ene glycol methyl ether. Good to use with XZ-92741.00 for halogen free electrical laminates.				√	
XZ-92740.00	176-181	3,000-5,000	84-86	Multi-functional epoxy resin solution for HF formulation to be used with XZ-92741.00.				√	
XZ-92757.00	195-210	500-4,000	84-86	High Tg multi-functional epoxy resin solution.				√	
XZ-92755.00		100-300	59-61	High Tg phenolic hardener solution in methyl ethyl ketone.				√	

Phosphorous Containing Epoxy Resins and Hardeners

Grade	EEW on Solid	Viscosity mPa·s @ 25 °C	Solid Content %	Description	Application				
					C	PC	CEA	EE	WBC
PROLOGIC BF-140	310-340	1,600-2,600	73.5-75.5	Phosphorous containing epoxy resin solution for halogen free electrical laminates.				√	
XZ-92530.00	310-340	1,800-2,800	74-76	Phosphorous containing epoxy resin solution for halogen free electrical laminates.				√	
XZ-92741.00		800-2,400	56-58	Phenolic co-hardener with high phosphorous content for halogen free electrical laminates. May use with other hardeners to achieve high Tg.				√	
XQ-83006.00		900-2,400	59-61	Phenolic co-hardener with high phosphorous content for halogen free electrical laminates. May use with other hardeners to achieve high Tg, lower loss.				√	
XQ-83028.00		1,500-4,000	59-61	Phenolic co-hardener with high phosphorous content for halogen free electrical laminates. May use with other hardeners to achieve high Tg, higher reliability.				√	
XQ-83211.00		1,500-4,000	59-61	Phenolic co-hardener with high phosphorous content for halogen free electrical laminates. May use with other hardeners to achieve high Tg, higher reliability.				√	

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Solid Epoxy and Coating Resins, D.E.R.™ 600s, and D.E.H.™ Hardeners

Bisphenol A Solid Epoxy Resins

Grade	EEW	Viscosity in Solution[1] mPa·s @ 25 °C	Softening Point °C	Melt Viscosity mPa·s @ 150 °C	Description	Application				
						C	PC	CEA	EE	WBC
D.E.R. 671	475-550	160-250	75-85	400-950	Low molecular weight 1-Type solid epoxy resin designed for room temperature curing wet paints. Industry standard for heavy duty anti-corrosion paints for which many solutions exist.	√				
D.E.R. 661E	495-525		78-84	550-830	Unmodified standard 1-Type solid epoxy resin. Excellent base for many high quality chemical-resistant coatings withstanding exposure to corrosive atmospheres.		√			
D.E.R. 662E	590-630		87-93	1,100-2,100	Standard 2-Type epoxy resin for excellent flow in standard as well as in low temperature cure applications.		√			
D.E.R. 692	660-720		89-97	1,700-2,500	Low molecular weight 2.5-Type solid epoxy resin designed especially for decorative powder coating applications requiring excellent flow and gloss.		√			
D.E.R. 663U	730-820		92-102	2,000-4,000	Medium molecular weight 3-Type epoxy resin for both pure epoxy and epoxy/polyester hybrid powder coatings requiring good gloss and smoothness.		√			
D.E.R. 663UE	740-800		98-104	3,100-5,200	Medium molecular weight 3-Type epoxy resin for both pure epoxy and epoxy/polyester hybrid powder coatings requiring excellent flexibility.		√			
D.E.R. 664U	875-955		100-110	4,000-8,000	Medium molecular weight 4-Type epoxy resin to provide improved gloss and smoothness.	√	√			
D.E.R. 664UE	860-930		104-110	5,500-10,000	Medium molecular weight 4-Type epoxy resin for functional coatings to provide improved flexibility.	√	√			
D.E.R. 667E	1,600-1,950	2,000-2,900	126-137		High molecular weight 7-Type epoxy resin with improved solution stability. Suitable for metal decoration, interior and exterior can coatings, tube and drum linings, coil primers, and other industrial applications.	√	√			
D.E.R. 667-20	1,600-1,950	1,300-4,000	125-138		High molecular weight 7-Type epoxy resin designed for offering enhanced reactivity.	√				
D.E.R. 669E	2,500-4,000	4,500-10,000	142-162		High molecular weight 9-Type epoxy resin designed for can and coil coatings. Shows improved solution storage stability.	√				

Application Abbreviations

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Solid Epoxy and Coating Resins, D.E.R.™ 600s, and D.E.H.™ Hardeners

Bisphenol A Solid Epoxy Resins – Continued

Grade	EEW	Viscosity in Solution[1] mPa·s @ 25 °C	Softening Point °C	Melt Viscosity mPa·s @ 150 °C	Description	Application				
						C	PC	CEA	EE	WBC
D.E.R. 642U-20	500-560	350-470	89-97	1,900-3,300	Novolac modified solid resin for functional powder coatings. In combination with other resins provides excellent corrosion and chemical resistance combined with good mechanical properties. Typical applications include pipe coatings and internal drum linings.		√			
D.E.R. 672U	750-850		110-120	15,000-40,000	Novolac modified, higher molecular weight solid epoxy resin for more flexible, corrosion resistant epoxy powder coatings. Extra edge-coverage can be obtained by the addition of 10-50 % of this resin grade to the pipe or internal drum lining formulations.		√			
D.E.R. 6508	380-420		95-105	2,800-4,200	Specialty resin designed for high glass transition temperature fusion bonded epoxy coatings (up to 150 °C).		√			
D.E.R. 6510HT	410-440		105-114	7,500-9,500	Specialty resin designed for high glass transition temperature fusion bonded epoxy coatings (up to 170 °C).		√			
D.E.R. 6615	500-550		78-86	<1,000	Specialty resin designed for a low temperature cure, down to approximately 110 °C. Based on Olin patented process technology that allows combination of low melt viscosity while retaining sufficiently high softening point.		√			
D.E.R. 8230W5	770-860		82-95	800-3,000	A silicone flow agent provides maximum transparency in clear powder coatings. Also provides good slip and mar resistance.		√			

[1]Measured in 40% solution in diethylene glycol monobuthyl ether

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Solid Epoxy and Coating Resins, D.E.R.™ 600s, and D.E.H.™ Hardeners

Bisphenol A Epoxy Resin Solutions

Grade	EEW on Solid	Viscosity mPa·s @ 25 °C	Description	Application				
				C	PC	CEA	EE	WBC
D.E.R. 337-X80	230-260	500-1,200	Solution of D.E.R. 337 in xylene. The excellent resistance and physical properties for epoxy coal tar combinations and higher solids content marine coatings.	√				
D.E.R. 337-X90	230-250	5,000-15,000	Solution of D.E.R. 337 in xylene. Higher solids content than D.E.R. 337-X80 epoxy resin solution.	√				
D.E.R. 3680-X90(K)	230-270	1,200-3,200	Chemically modified low molecular weight epoxy resin in xylene. Offers lower viscosity allowing higher solids contents at similar corrosion protection properties. Improves lower temperature curing.	√				
D.E.R. 660-X80	300-335	3,500-7,000	Intermediate molecular weight epoxy resin in a xylene solution for high solids / build coatings. Combines the high solids and chemical resistance of liquid epoxy resins with the outstanding adhesion, flexibility, and fast cure of higher molecular weight solid epoxy resin.	√				
D.E.R. 671-X75	430-480	7,500-11,500	Solution of D.E.R. 671 in xylene. Industry standard for heavy duty anti-corrosion paint.	√				
D.E.R. 3620	800-1,100	2,000-5,000	Solution of modified solid epoxy in xylene solution for high solids baking coatings with outstanding flexibility and low VOC.	√				
D.E.R. 684-EK40	2,800 min.	600-2,500	Solution of an ultra-high molecular weight epoxy resin. It has essentially no epoxy functionality and provides coatings with outstanding physical and chemical resistance properties by solvent evaporation alone. Main applications include maintenance- and flash-primers, shop coats, wire enamels, road markers, and clear coatings for brass, chrome, and aluminum.	√				

Solid Hardeners for SER

Grade	EW	Softening Point °C	Melt Viscosity @ 150 °C	Description	Application				
					C	PC	CEA	EE	WBC
D.E.H.80	245-275	83-90		Phenolic hardener containing curing catalyst and polyacrylate flow modifier of moderate reactivity. Phenolic curing agents offer excellent chemical and moisture/water resistance and improved flexibility compared to e.g., dicyandiamide curing agents.		√			
D.E.H. 81	240-270	83-90		Phenolic curing agent of intermediate reactivity containing curing catalyst as well as a polyacrylate flow modifier. The intermediate reactivity makes D.E.H. 81 particularly suitable as starting base for product development.		√			
D.E.H. 82	235-265	83-90		High reactivity phenolic curing agent containing curing catalyst as well as a polyacrylate flow modifier. Can be formulated in low temperature applications in combination with D.E.R.™ 6615 solid epoxy resin.		√			
D.E.H. 84	240-270	83-90	290-470	Phenolic curing agent of intermediate reactivity containing only curing catalyst. The lack of flow modifier allows formulation with alternative additives that could potentially cause compatibility problems.		√			
D.E.H. 85	250-280	83-90	290-470	Unmodified phenolic curing agent particularly suitable for optimizing the reactivity of hardeners such as D.E.H. 81, D.E.H. 82, or D.E.H. 84 phenolic curing agent.		√			
D.E.H. 87	370-400	96-102	1,200-1,600	Unmodified, high molecular weight phenolic hardener for increased flexibility and good storage stability.		√			
D.E.H. 90	240-270	76-84	100-300	Phenolic curing agent for fast cure combined with superior adhesion under humid conditions. Suitable also for low application temperature applications in combination with D.E.R. 6615 solid epoxy resin.		√			

Waterborne Epoxy Resins and Waterborne Epoxy Hardeners

Waterborne Epoxy Resins

Grade	EEW as Supplied	Solid Content %	Description	Application				
				C	PC	CEA	EE	WBC
D.E.R. 915	1,050	46-48	Waterborne dispersion of 1-Type solid epoxy resins for 2-component coating systems. Offers good corrosion protection on steel as well as fast-drying on mineral substrates.	√				
D.E.R. 916	330	57-59	Semi-solid epoxy novolac resin dispersion designed for 2-component coating systems. Can produce highly cross-linked matrices, providing excellent heat and chemical resistance similar to solvent-borne novolac systems.	√				
D.E.R. 917	310	63-65	Offers low average particle size and narrow particle size distribution that allows good storage stability and excellent film formation without any solvents and/or diluents, which is designed for two-pack system.	√				
D.E.R. 926	1,000	51-53	A non-ionic aqueous dispersion of a 1-Type, bisphenol A epoxy resin, outstanding flexibility and water resistance.	√				
D.E.R. 930	335	78-82	A self-emulsifiable resin for the use of waterborne zinc rich primer, good corrosion resistance and storage stability.	√				

Waterborne Hardeners

Grade	EW as Supplied	Viscosity mPa·s @ 25 °C	Solid Content %	Description	Application				
					C	PC	CEA	EE	WBC
D.E.H. 806	200	9,500-15,500	80	Aqueous polyamine adduct solution with emulsification capability. Offers excellent chemical, corrosion resistance.	√				
D.E.H. 826	270	10,000-60,000	50	A special modified waterborne hardener to cure with epoxy resin, it showcases fast initial dry speed and corrosion resistance.	√				

Flexible Epoxy Resins, D.E.R.™ 700s

Flexible Epoxy Resins, D.E.R.™ 700s

Grade	EEW	Viscosity mPa·s @ 25 °C	Description	Application				
				C	PC	CEA	EE	WBC
D.E.R. 732	310-330	60-70	Longer chain length polyglycol diepoxide liquid resin. Applications include coatings and adhesives for improved flexibility, elongation, and impact resistance.	√		√		
D.E.R. 736	175-205	30-60	Shorter chain polyglycol diepoxide liquid resin for improved flexibility, elongation, and impact resistance in coatings and adhesives.	√		√		

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AIRSTONE™, MARK Composite Systems

Infusion

Grade	Pot Life RT 100g, min	Gel Time @ 70 °C, min	Mix Viscosity mPa·s @ 25 °C	Tg DSC, 10K/min, °C	Description	Application C	PC	CEA	EE	WBC
AIRSTONE 760E/762H	30-60	3-8	200-400	85-95	Low viscosity, fast cure system.					√
AIRSTONE 760E/766H	100-150	15-30	200-300	85-95	Low viscosity, long pot life system.					√
AIRSTONE 760E/7613H	30-60	10-20	200-400	85-95	Low viscosity, medium pot life system.					√
AIRSTONE 891E/895H	100-150	15-30	200-300	85-95	Low viscosity, long pot life, low exotherm system.					√

Adhesive

Grade	Open Time RT 100g, min	Gel Time @ 70 °C, min	Cured Density @ 25 °C, g/cm3	Tg DSC, 10K/min, °C	Description	Application C	PC	CEA	EE	WBC
AIRSTONE 770E/772H	30-60	2-6	1.3-1.4	95-105	Fast cure, high strength, high modulus adhesive with elongation at 2 %.					√
AIRSTONE 770E/778H	90-120	5-10	1.3-1.4	95-105	Standard pot life, high strength, high modulus adhesive with elongation at 2 %.					√
AIRSTONE 770E-T3/778H-T	90-120	5-10	1.2-1.3	90-100	Standard pot life, medium strength, medium modulus adhesive with elongation at 3 %.					√
AIRSTONE 870E/878Hc	90-150	5-10	1.1-1.2	85-95	Standard pot life, high toughness adhesive with elongation >5 %.					√

Laminating, Hand Lay-Up

Grade	Pot Life RT 100g, min	Gel Time @ 70 °C, min	Mix Viscosity mPa·s @ 25 °C	Tg DSC, 10K/min, °C	Description	Application C	PC	CEA	EE	WBC
AIRSTONE 730E/734H	10-20	2-6	1000-1500	70-80	Extra fast cure, good for vertical application.					√
AIRSTONE 730E/735H	30-50	3-8	600-1000	75-85	Fast cure, applicable for vertical application.					√
AIRSTONE 730E/736H	120-180	10-20	300-600	75-85	Longer pot life, applicable for larger parts.					√
AIRSTONE 720E/723H	60-120	5-10	900-1300	95-105	Applicable for vertical application.					√

Mold

Grade	Pot Life RT 100g, min	Gel Time @ 120 °C, min	Mix Viscosity mPa·s @ 25 °C	Tg DSC, 10K/min, °C	Description	Application C	PC	CEA	EE	WBC
XZ 92742/713H	40-80	3-6	200-400	130-140	Heat resistant to 120 °C.					√
AIRSTONE 329E/713H	30-60	2-5	300-600	140-150	Heat resistant to 130 °C.					√
AIRSTONE 329E/718H	40-80	3-6	300-600	145-155	Heat resistant to 140 °C.					√

AIRSTONE™, MARK Composite Systems

Pultrusion

Grade	Pot Life 40 °C 100g, hr	Gel Time @ 150 °C, sec	Mix Viscosity mPa·s @ 25 °C	Tg DSC, 10K/min, °C	Description	Application C	PC	CEA	EE	WBC
MARK 0431E/0431H	≥8	40-80	800-1,300	110-120	Balanced cost vs. performance.					√
AIRSTONE 550E/555H/555C	≥7	30-70	800-1,300	110-120	Higher line speed, suitable for both carbon fibers and glass fibers.					√
AIRSTONE 560E/565H/565C	≥7	30-70	1000-1,500	110-120	Higher line speed, designed for glass fibers.					√
AIRSTONE 570E/575H/575C	≥5	20-60	900-1,400	110-120	Premium line speed.					√
AIRSTONE 580E/580H/580C	≥7	40-80	500-1,000	110-120	Higher line speed, lower viscosity, better wetting.					√
AIRSTONE 1121E/1121H	≥8	30-70	700-1,000	110-130	Lighter color.					√
AIRSTONE 1122E/1122H	≥8	40-90	600-900	160-180	High temperature and chemical resistance.					√

Filament Winding

Grade	Pot Life RT 100g, hr	Gel Time @ 90 °C, min	Mix Viscosity mPa·s @ 25 °C	Tg DSC, 10K/min, °C	Description	Application C	PC	CEA	EE	WBC
AIRSTONE 541E/546H	≥8	10-20	500-900	110-120	High toughness.					√
LITESTONE 2130E/2142H	≥12	20-30	400-600	110-120	High toughness, good wetting.					√

Casting

Grade	Pot Life RT 100g, min	Gel Time @ 80 °C, min	Mix Viscosity mPa·s @ 25 °C	Tg DSC, 10K/min, °C	Description	Application C	PC	CEA	EE	WBC
MARK 2012A / 2012B	100-150	20-30	100-200	75-85	Ultra low viscosity, fast cure, anti-corrosion.					√

FORTEGRA™ Toughening Additives

FORTEGRA™ Toughening Additives

Grade	EEW	Viscosity mPa·s @ 25 °C	Description	Application C	PC	CEA	EE	WBC
FORTEGRA 102	345-374	4,000-8,000	Toughened bisphenol A liquid epoxy resin master-batch (50 wt%). Allows easy formulation into other liquid epoxy binder systems for composite as well as coating applications.					√
FORTEGRA 202	NA	4,500-8,000	Low-viscosity toughener based on innovative technology. Imparts adhesion, impact resistance and anti-corrosion resistance via nanometer size phase separation in curing matrix.	√				√
FORTEGRA 304	920-1,090	105-115	Specialty solid resin designed to improve flexibility and impact resistance of fusion bonded epoxy coatings.		√			

FORTEGRA™ Toughening Additives

FORTEGRA™ Toughening Additives - Continued

Grade	EEW	Viscosity mPa·s @ 25 °C	Description	Application				
				C	PC	CEA	EE	WBC
FORTEGRA 310	400-450	105-117	Specialty resin designed to improve flexibility and impact resistance of fusion bonded epoxy coatings with high glass transition temperature (up to 170 ˚C).		√			
FORTEGRA 352	248-268	17,000-23,000[1]	A stable dispersion of preformed novel Core Shell Rubber (CSR) particles in a bisphenol A liquid epoxy resin containing 33 wt% of the CSR.					√

[1]Brookfieled, 50 ˚C, Spindle 29 @ 40 rpm

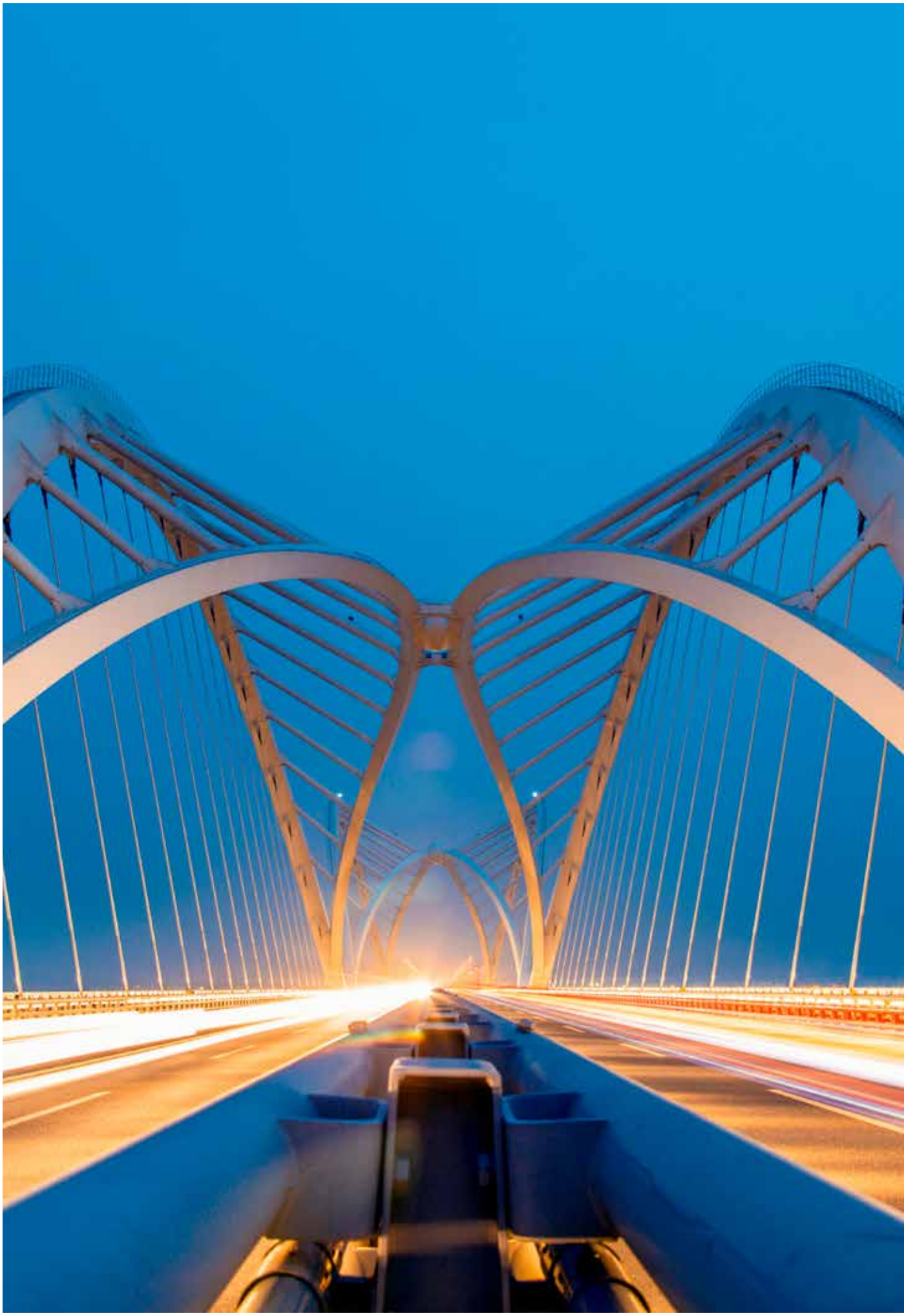
POLY-CARB MARK Products

POLY-CARB MARK Products

Grade	EEW	Viscosity mPa·s @ 25 °C	Amine Value meq/g	Description	Application				
					C	PC	CEA	EE	WBC
POLY-CARB MARK 165 Epoxy Resin Part A	250 - 270	2,500-5,500		Polymer thin layer pavement system for road and bridge, with good balance of strength and flexibility, and high anti-skid performance.			√		
POLY-CARB MARK 165 Epoxy Hardener Part B		100-300	700-800				√		
POLY-CARB MARK 165NF Epoxy Resin Part A	250-270	1,500-5,500		Nonylphenol free version of MARK 165 polymer thin layer pavement system in compliance with specific product regulation.			√		
POLY-CARB MARK 165NF Epoxy Hardener Part B		100-300	700-800				√		
POLY-CARB MARK 169 A	205-225	10,000-20,000		Polymer thin layer pavement system for road and bridge, with good balance of very fast curing speed and moderate strength.			√		
POLY-CARB MARK 169 B		1,000-2,000	270-370				√		
POLY-CARB MARK 135P Epoxy Resin Part A	160-200	250-500		Low viscosity penetrating crack treatment.			√		
POLY-CARB MARK 135 Epoxy Hardener Part B		50-100	6.00-7.00				√		
POLY-CARB MARK 135NF Epoxy Resin Part A	160-200	250-500		Nonylphenol free version of MARK 135 crack treatment in compliance with specific product regulation.			√		
POLY-CARB MARK 135NF Epoxy Hardener Part B		50-100	6.00-7.00				√		

Application Abbreviations

Coatings (C) Powder Coatings (PC) Civil Engineering Adhesives (CEA) Electrical Electronics (EE) Wind Blades Composites (WBC)



Appendix – Regulatory Status[1]

Liquid Epoxy Resins, D.E.R.™ 300s, and D.E.H.™ Hardeners

Grade	Chinese Mainland (IECSC)	Taiwan (TCSI)	Korea (KECI)	Japan (ENCS)	Japan (ISHL)	Philippines (PICCS)	Australia (AICS)	New Zealand (NZIoC)
Bisphenol A Epoxy Resin								
D.E.R. 331	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 383	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 330	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 332	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 337	Y	Y	Y	Y	Y	Y	Y	Y
Bisphenol F Epoxy Resin								
D.E.R. 354	Y	Y	Y	Y	Y	Y	Y	Y
Low Viscosity Epoxy Resin Blends, Modified Epoxy Resins								
D.E.R. 301	R	Y	R	N	N	N	N	N
D.E.R. 324	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 351	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 353	Y	Y	Y	Y	Y	Y	Y	Y
Modified Amine Hardener								
D.E.H. 4702	Y	Y	Y	Y	Y	Y	Y	Y
Low Temperature Cure Hardener								
D.E.H. 613	Y	N	N	Y	Y	N	N	N
D.E.H. 615	Y	N	N	Y	Y	N	N	N
D.E.H. 622	Y	Y	Y	Y	Y	Y	Y	Y

Novolac Type Epoxy Resins, D.E.N.™ 400s

Grade	Chinese Mainland (IECSC)	Taiwan (TCSI)	Korea (KECI)	Japan (ENCS)	Japan (ISHL)	Philippines (PICCS)	Australia (AICS)	New Zealand (NZIoC)
D.E.N. 431	Y	Y	Y	Y	Y	Y	Y	Y
D.E.N. 438	Y	Y	Y	Y	Y	Y	Y	Y
D.E.N. 438-A85	Y	Y	Y	Y	Y	Y	Y	Y
D.E.N. 438-EK85	Y	Y	Y	Y	Y	Y	Y	Y
D.E.N.438-X80	Y	Y	Y	Y	Y	Y	Y	Y

Legend

Y: Components of the product are listed on the respective inventory.

N: One or more components are not listed on the respective inventory.

R: Certain types of registration, notification, or exemption applications have been filed for this product, most often for a specific Blue Cube legal entity. Annual volume restrictions may apply. Please consult your sales representative or send an email to info@olin.com.

Please note the specific information for the following regions or countries:

Taiwan: Import of any chemical substance with accumulated volume >100kg/yr requires completion of Phase I notification, which is the responsibility of the importer.

South Korea: Please inquire for a Letter of Confirmation (LoC) from Olin via email to info@olin.com.

New Zealand: Import and sale requires compliance with the Hazardous Substances and New Organisms (HSNO) Act in line with the final application of the product and is the responsibility of the customer.

[1]The Appendix tables give the status of product components under relevant inventories for your convenience and is presented in good faith as of 2020. Additional requirements may apply and the customer needs to validate and may need to establish compliance under certain requirements (See Legend for more information). For a blank column or the latest status, please contact Sales or Customer Services.

Appendix – Regulatory Status[1]

Brominated Epoxy, Halogen Free Resins, D.E.R.™ 500s, and PROLOGIC™

Grade	Chinese Mainland (IECSC)	Taiwan (TCSI)	Korea (KECI)	Japan (ENCS)	Japan (ISHL)	Philippines (PICCS)	Australia (AICS)	New Zealand (NZIoC)
Low Br Epoxy Resins								
D.E.R. 530-A80	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 538-A80	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 539-A80	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 539-EK80	Y	Y	Y	Y	Y	Y	Y	Y
High Br Epoxy Resins								
D.E.R. 542	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 560	Y	Y	Y	Y	Y	Y	Y	Y
Specialty Epoxy Resins – Brominated								
D.E.R. 592-A80	Y	Y	Y	Y	Y	N	N	Y
D.E.R. 593	Y	Y	Y	Y	Y	N	N	Y
XU-19074.00	Y	Y	Y	Y	Y	N	N	Y
XQ-82937.00	Y	Y	Y	Y	Y	N	N	Y
XZ-92754.00	N	N	N	Y	Y	N	N	N
Specialty Epoxy Resins – Non-brominated								
XZ-97103.00		Y	R	Y	Y	N	N	N
XZ-97103.02		Y	R	Y	Y	N	N	N
D.E.R. 858	Y	Y	R	Y	Y	N	N	Y
XZ-92566.00	Y	Y	R	Y	Y	N	N	Y
XZ-92748.00	Y	Y	Y	Y	Y	Y	Y	Y
XZ-92740.00	Y	Y	Y	Y	Y	Y	Y	Y
XZ-92757.00	Y	Y	Y	Y	Y	Y	Y	Y
XZ-92755.00	N	Y	Y	Y	Y	N	N	Y
Phosphorous Containing Epoxy Resins and Hardeners								
PROLOGIC BF-140	Y	Y	N	N	N	N	N	N
XZ-92530.00	Y	Y	N	N	N	N	N	N
XZ-92741.00	R	Y	Y	Y	Y	N	N	N
XQ-83006.00	R	Y	Y	Y	Y	N	N	N
XQ-83028.00	R	Y	Y	Y	Y	N	N	Y
XQ-83211.00	R	Y	Y	Y	Y	N	N	Y

Legend

Y: Components of the product are listed on the respective inventory.

N: One or more components are not listed on the respective inventory.

R: Certain types of registration, notification, or exemption applications have been filed for this product, most often for a specific Blue Cube legal entity. Annual volume restrictions may apply. Please consult your sales representative or send an email to info@olin.com.

Please note the specific information for the following regions or countries:

Taiwan: Import of any chemical substance with accumulated volume >100kg/yr requires completion of Phase I notification, which is the responsibility of the importer.

South Korea: Please inquire for a Letter of Confirmation (LoC) from Olin via email to info@olin.com.

New Zealand: Import and sale requires compliance with the Hazardous Substances and New Organisms (HSNO) Act in line with the final application of the product and is the responsibility of the customer.

[1]The Appendix tables give the status of product components under relevant inventories for your convenience and is presented in good faith as of 2020. Additional requirements may apply and the customer needs to validate and may need to establish compliance under certain requirements (See Legend for more information). For a blank column or the latest status, please contact Sales or Customer Services.

Appendix – Regulatory Status

Solid Epoxy and Coating Resins, D.E.R.™ 600s, and D.E.H.™ Hardeners

Grade	Chinese Mainland (IECSC)	Taiwan (TCSI)	Korea (KECI)	Japan (ENCS)	Japan (ISHL)	Philippines (PICCS)	Australia (AICS)	New Zealand (NZIoC)
Bisphenol A Type Solid Epoxy Resins								
D.E.R.671	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 661E	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 662E	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 692	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 663U	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 663UE	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 664U	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 664UE	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 667E	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 667-20	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 669E	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 642U-20	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 672U	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 6508	Y	Y	R	Y	Y	N	N	Y
D.E.R. 6510HT		N	R	Y	Y	N	N	N
D.E.R. 6615	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 8230W5	Y	Y	Y	Y	Y	Y	Y	Y
Bisphenol A Type Epoxy Resin Solution								
D.E.R. 337-X80	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 337-X90	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 3680-X90(K)	Y	Y	Y	Y	Y	N	Y	Y
D.E.R. 660-X80	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 671-X75	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 3620	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 684-EK40	Y	Y	Y	Y	Y	Y	Y	Y
Solid Hardener for SER								
D.E.H. 80	Y	Y	Y	Y	Y	Y	Y	Y
D.E.H. 81	Y	Y	Y	Y	Y	Y	Y	Y
D.E.H. 82	Y	Y	Y	Y	Y	Y	Y	Y
D.E.H. 84	Y	Y	Y	Y	Y	Y	Y	Y
D.E.H. 85	Y	Y	Y	Y	Y	Y	Y	Y
D.E.H. 87	Y	Y	Y	Y	Y	Y	Y	Y
D.E.H. 90	Y	N	Y	Y	Y	N	N	Y
Waterborne Epoxy								
D.E.R. 915	R	R	N	N	N	N	N	N
D.E.R. 916	R	Y	N	Y	Y	N	R	Y
D.E.R. 917	R	Y	N	Y	Y	N	R	Y
D.E.R. 926	Y	N	N	N	N	N	N	N
D.E.R. 930	R	Y	N	N	N	N	N	Y
Waterborne Hardener								
D.E.H. 806	R	N	N	N	N	N	N	N
D.E.H. 826	Y	Y	N	Y	Y	N	N	N

Appendix – Regulatory Status

Flexible Epoxy Resins, D.E.R.™ 700s

Grade	Chinese Mainland (IECSC)	Taiwan (TCSI)	Korea (KECI)	Japan (ENCS)	Japan (ISHL)	Philippines (PICCS)	Australia (AICS)	New Zealand (NZIoC)
D.E.R. 732	Y	Y	Y	Y	Y	Y	Y	Y
D.E.R. 736	Y	Y	Y	Y	Y	Y	Y	Y

AIRSTONE™, MARK Composite Systems

Grade	Chinese Mainland (IECSC)	Taiwan (TCSI)	Korea (KECI)	Japan (ENCS)	Japan (ISHL)	Philippines (PICCS)	Australia (AICS)	New Zealand (NZIoC)
Infusion								
AIRSTONE 760E	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 762H	Y	Y	Y	Y	Y	N	Y	Y
AIRSTONE 766H	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 7613H	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 891E	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 895H	Y	Y	Y	Y	Y	Y	Y	Y
Adhesive								
AIRSTONE 770E	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 778H	Y	Y	Y	Y	Y	Y	N	Y
AIRSTONE 770E-T3 PTA	Y	N	N	Y	Y	N	N	Y
AIRSTONE 778H-T PTB	Y	N	N	Y	Y	N	N	Y
AIRSTONE 772H	Y	Y	Y	Y	Y	N	Y	Y
AIRSTONE 870E	Y		Y	Y	Y	Y	Y	N
AIRSTONE 878Hc	Y	Y	Y	Y	Y	Y	Y	Y
Laminating, Hand Lay-up								
AIRSTONE 730E	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 734H	Y	Y	Y	Y	Y	N	Y	Y
AIRSTONE 735H	Y	Y	Y	Y	Y	N	Y	Y
AIRSTONE 736H	Y	Y	N	Y	Y	N	N	N
AIRSTONE 720E	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 723H	Y	Y	Y	Y	Y	N	Y	Y
Mold								
AIRSTONE 329E	Y	Y	Y	Y	Y	Y	Y	Y
XZ 92742.00	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 713H	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 718H	Y	Y	N	N	N	N	N	N
Pultrusion								
MARK 0431E	Y	Y	Y	Y	Y	Y	Y	Y
MARK 0431H	Y	Y	Y	Y	Y	Y	Y	N
AIRSTONE 550E	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 555H	Y	Y	Y	Y	Y	Y	Y	N
AIRSTONE 555C	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 560E	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 565H	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 565C	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 570E	Y	Y	Y	N	N	N	Y	Y
AIRSTONE 575H	Y	Y	Y	Y	Y	Y	Y	N
AIRSTONE 575C	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 580E	Y	Y	Y	Y	Y	Y	Y	Y

Appendix – Regulatory Status

AIRSTONE™, MARK Composite Systems

Pultrusion – Continued								
AIRSTONE 580H	Y	Y	Y	Y	Y	Y	N	Y
AIRSTONE 580C	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 1121E	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 1121H	Y	Y	Y	Y	Y	Y	N	N
AIRSTONE 1122E	Y	Y	R	Y	Y	N	N	Y
AIRSTONE 1122H	Y	Y	Y	N	Y	Y	Y	N
Filament Winding								
AIRSTONE 541E	Y	Y	Y	Y	Y	Y	Y	Y
AIRSTONE 546H	R	N	N	N	N	N	N	N
LITESTONE 2130E	Y	Y	Y	Y	Y	Y	Y	Y
LITESTONE 2142H	Y	Y	Y	Y	Y	Y	Y	N
Casting								
MARK 2012A Epoxy Resin Part A	Y	Y	Y	Y	Y	Y	Y	Y
MARK 2012B Epoxy Hardener Part B	Y	Y	Y	Y	Y	Y	Y	Y

FORTEGRA™ Toughening Additives

Grade	Chinese Mainland (IECSC)	Taiwan (TCSI)	Korea (KECI)	Japan (ENCS)	Japan (ISHL)	Philippines (PICCS)	Australia (AICS)	New Zealand (NZIoC)
FORTEGRA 102	Y	Y	Y	Y	Y	Y	Y	Y
FORTEGRA 202	R	N	N	N	N	N	N	Y
FORTEGRA 304	Y	Y	Y	Y	Y	Y	Y	Y
FORTEGRA 310		N	R	Y	Y	N	N	N
FORTEGRA 352	Y	Y	Y	Y	Y	Y	Y	Y

POLY-CARB MARK Products

Grade	Chinese Mainland (IECSC)	Taiwan (TCSI)	Korea (KECI)	Japan (ENCS)	Japan (ISHL)	Philippines (PICCS)	Australia (AICS)	New Zealand (NZIoC)
POLY-CARB MARK 165 Epoxy Resin Part A	Y	N	Y	Y	Y	Y	Y	N
POLY-CARB MARK 165 Epoxy Hardener Part B	Y	Y	Y	N	N	N	Y	N
POLY-CARB MARK 165NF Epoxy Resin Part A	R	N	N	N	N	N	N	N
POLY-CARB MARK 165NF Epoxy Hardener Part B	Y	Y	Y	Y	Y	N	Y	Y
POLY-CARB MARK 169A	R	Y	R	N	N	N	N	N
POLY-CARB MARK 169B	Y	Y	Y	Y	Y	Y	Y	Y
POLY-CARB MARK 135P Epoxy Resin Part A	Y	Y	Y	Y	Y	Y	Y	Y
POLY-CARB MARK 135 Epoxy Hardener Part B	Y	Y	Y	Y	Y	Y	Y	Y
POLY-CARB MARK 135NF Epoxy Resin Part A	Y	Y	Y	Y	Y	Y	Y	Y
POLY-CARB MARK 135NF Epoxy Hardener Part B	Y	Y	Y	Y	Y	N	Y	Y

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